Partial English translation of the related portion
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Referring to Fig. 1, 1 is a surface light source, 2 is a lenticular sheet for focusing light in a vertical direction, and 3 is a lenticular sheet focusing light in a horizontal direction.

4 is a photosensitive agent layer arranged on one plane of the lenticular sheet 3, 5 is an opaque portion having light absorption characteristics on the photosensitive agent layer 4, and 6a and 6b are transparent portions that do not have light absorption characteristics on the photosensitive agent layer 4.

7a, 7b, 7c, and 7d are lights input from the surface light source 1 to a screen which includes the lenticular sheets 2 and 3 and the photosensitive agent layer 4. 8a, 8b, 8c, and 8d are lights output from the screen.

First, peripheries of the lenticular sheets 2 and 3 are bonded by an adhesive or a heating and melting method or the like in order to prevent the positional relationship of the two sheets 2 and 3 from being deviated with each other. Next, in a dark room, the photosensitive agent is uniformly applied to one surface of the bonded lenticular sheets 2 and 3 and dried so as to form the photosensitive agent layer 4.

Then, the photosensitive agent layer 4 is exposed to an

appropriate amount of light by the surface light source 1. The surface light source 1 is arranged on the side opposite to the photosensitive agent layer 4 of the screen member that is thus configured.

It is preferable to make the positional relationship between the aperture surface of the surface light source 1 and the screen member substantially equal to the positional relationship between the aperture surface of a project lens of a projector and the screen when the screen that is manufactured according to the present invention is actually used. It is also preferable to substantially equalize the aperture dimension of the surface light source 1 and the aperture dimension of the projector.

Therefore, when the image is projected on the screen according to the present invention, the surface light source 1 is set so that the image on the aperture surface of the project lens of the projector is focused on each opaque hole of a porous mask in the screen according to the present invention.

The light input from the surface light source 1 to the screen member is bent by the lenticular sheet 2 in the vertical direction, and then bent by the lenticular sheet 3 in the horizontal direction.

The curvature and the distance of the lens surfaces of the lenticular sheets 2 and 3 are regulated in advance so that

the focal points of the lenticular sheets 2 and 3 are made to coincide. Then the two sheets 2 and 3 are bonded to each other. Then the photosensitive agent layer 4 is provided adjacent to the coincided focal point. By doing this process, only a part of the photosensitive agent layer is exposed to the light as shown in 6a and 6b.

After this exposure, the development process is carried out so that the exposed portion of the photosensitive agent is cleared or removed and the unexposed portion is blackened or cured and remained.

As the matter of course, well-known reversal development process is needed if the photosensitive agent layer is a normal silver salt photosensitive agent. However, the photosensitive agent layer having positive-positive characteristics is typically used in view of easiness of development operation.

Further, as a procedure for providing the photosensitive agent layer on the screen, it is also possible to provide a photosensitive agent layer on one plane of the lenticular sheet 3 first, and then bond the lenticular sheet 2 with the lenticular sheet 3 in Fig. 1.

Otherwise, the photosensitive agent layer may be provided in advance on another thin transparent sheet that is not shown, and then the lenticular sheet 3 may be bonded with the transparent sheet.

It is important to carry out the exposure development process after integrally forming the lenticular sheets 2 and 3 and the photosensitive agent layer 4 and to keep this relative position relationship even after the exposure development process.

In order to increase the resolution ability of the screen, it is preferable that the pitches between convex portion and convex portion or between concave portion and concave portion of the lenticular sheets are made as small as possible. By doing this, light spots that are horizontally or vertically focused depending on the combination of the lenticular sheets are formed on the multiple screen surfaces in small pitches.

Now we assume a case in which each of the lenticular sheets 2 and 3 and the photosensitive agent layer 4 is formed in a removable way. In this case, only the photosensitive agent layer is removed after being exposed, the development process is carried out on the removed photosensitive agent layer, and then the lenticular sheets 2 and 3 and the photosensitive agent layer 4 are bonded together to form the screen. In this case, it is difficult to accord the position of the light spots that are focused on the lenticular sheets and the position of the transparent portions provided on the photosensitive agent layer because the degree of expansion due to the temperature or the mechanical stress of each material is different from each other.

If the position of the light source and the position of the transparent portions do not accord with each other, the light flux of the projected image is partially interrupted by the opaque portion on the photosensitive agent layer and the light amount that is input to the observer's eyes is reduced. Therefore, if the light amount in indoor light that is reflected on the screen surface is constant, the contrast of the projected image on the screen surface is significantly reduced.

Now we assume another case. In this case, the mask layer having the transparent portions and the opaque portion is made by a photographic operation or an operation such as a printing procedure by using an appropriate photographic original plate having transparent portions and opaque portion. Then the mask layer is bonded to the screen surface made of the lenticular sheets. Even in this case as well, the part of the light is shut out.

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Fig. 3 is an explanation diagram of the screen having a configuration in which a transparent flat plane substrate 10 having a photosensitive agent layer 11 is bonded to one surface of a single lenticular sheet 9. The lenticular sheet 9 has a lenticular surface focusing light in the vertical direction and a lenticular surface focusing light in the horizontal direction on the other side surface. 12 is a light-absorbing opaque

portion and 13 are the transparent portions, both of which being provided on the photosensitive agent layer 11.

Fig. 4 is the screen having a configuration in which a plane side of the lenticular sheet 14 focusing the light in the horizontal direction and the convex surface of the lenticular sheet 15 focusing the light only in the vertical direction face with each other so as to provide the photosensitive agent layer 11 in the plane side of the lenticular sheet 15. Fig. 5 is an example of the screen formed by providing the photosensitive agent layer 11 in the plane side of the sheet 16 having a plurality of fly-eye lenses.

Needless to say, it is possible to provide the transparent sheet shown in 10 in Fig. 3 as the substrate of the photosensitive agent between the lens sheets 14, 15, or 16 and the photosensitive agent layer 11 so as to bond the transparent sheet and the lens sheets in Figs. 4 and 5.

If there is provided a substrate of the photosensitive agent thus structured, the convex surface of the lens sheets 14, 15, or 16 may be bonded to the photosensitive substrate in Figs. 4 and 5 instead of bonding the plane sides of the the lens sheets 14, 15, or 16 and the photosensitive substrate. This is also in the scope of the present invention.